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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/597,708

08/04/2006

Arjan Franklin Bakker

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS

P.O. BOX 3001

BRIARCLIFF MANOR, NY 10510

EXAMINER

TURNER, SAMUEL A

ART UNIT

PAPER NUMBER

2877

MAIL DATE

DELIVERY MODE

07/23/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/597,708	Applicant(s) BAKKER, ARJAN FRANKLIN	
	Examiner SAMUEL A. TURNER	Art Unit 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 18 May 2009 has been entered.

Claim Rejections - 35 USC § 102

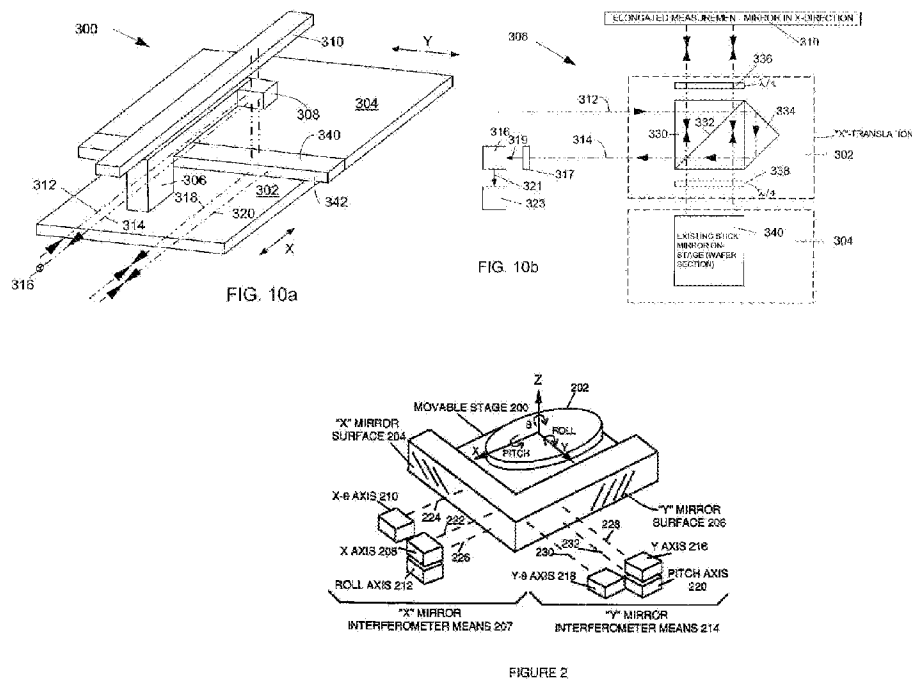
Applicant's amendment has overcome the rejection of claims 1 and 6-9 under 35 U.S.C. § 102(a)(1), see pages 5 and 6 of Applicant's remarks.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2 and 6-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hill(6,650,419) in view of Cameron(5,363,196).



With regard to claim 1, Hill teaches a system(Fig. 1) for positioning a product, comprising a chuck for supporting the product(Fig. 1, 304), an intermediate stage supporting said chuck(Fig. 1, 302), and a stationary base supporting said intermediate stage(Fig. 1, 310; column 17, lines 53-59), whereby the chuck can move with respect to the intermediate stage in a first direction X(Fig. 1, Y) and the intermediate stage can move with respect to said stationary base in a second direction Y(Fig. 1, X), furthermore comprising a first laser interferometer for measuring the position of the chuck relative to the stationary base(Fig. 1, 308), a main part of said laser interferometer including optical components for receiving and directing a laser(Fig. 1, 308), the main part being attached to said intermediate stage and being movable therewith(Fig. 1, 308; by support 306) for measuring the distance between an elongated plane mirror reflector on the chuck that is elongated

in the first direction X(**Fig. 1, 340**) and an elongated plane mirror reflector on the stationary base that is elongated in the second direction Y(**Fig. 1, 310**). **Note that the XY coordinates in Hill are switched to those found in the claimed invention.**

Hill **fails to teach** a second interferometer mounted on the intermediate stage which measures the distance between a second elongated plane mirror reflector on the chuck that is elongated in the first direction X and the elongated plane mirror reflector on the stationary base that is elongated in the second direction Y.

As to claim 2/1, Hill **fails to teach** the second reflector having a length larger than the maximal displacement of the intermediate stage in said second direction Y.

As to claim 6/1, Hill teaches wherein the first main part is attached to said intermediate stage for measuring the distance in the third direction Z between the reflector on the chuck and the reflector on the stationary base, which third direction Z is perpendicular to the first direction X and the second direction Y(**column 18, lines 14-19**). Hill **fails to teach** the second Z-axis interferometer.

With regard to claim 7, Hill teaches a method for positioning a product by means of a system comprising a chuck for supporting the product(**Fig. 1, 304**), an intermediate stage supporting said chuck(**Fig. 1, 302**), and a stationary base supporting said intermediate stage(**Fig. 1, 310; column 17, lines 53-59**), whereby the chuck can move with respect to the intermediate stage in a first direction X(**Fig. 1, Y**) and the intermediate stage can move with respect to said stationary base in a second direction Y(**Fig. 1, X**), the method comprising attaching a first laser

interferometer to the intermediate stage, the laser interferometer further comprising a main part including optical components for receiving and directing a laser, the main part being movable with the intermediate stage(column 17, lines 53-67), and measuring the position of the chuck relative to the stationary base by measuring a distance between a first elongated reflector on the chuck(Fig. 1, 340) and a second elongated reflector on the stationary base(Fig. 1, 310) using the laser interferometer(column 18, lines 1-27). **Note that the XY coordinates in Hill are switched to those found in the claimed invention.** Hill fails to teach a second interferometer mounted on the intermediate stage which measures the distance between a second elongated plane mirror reflector on the chuck that is elongated in the first direction X and the elongated plane mirror reflector on the stationary base that is elongated in the second direction Y.

As to claim 8/7, Hill teaches wherein the first elongated reflector is elongated in the first direction X(Fig. 1; 340,Y) and the second elongated reflector is elongated in the second direction Y(Fig. 1; 310,X). **Hill fails to teach** the second elongated reflector that is elongated in the first direction X.

As to claim 9/7, Hill teaches moving the chuck relative to the stationary base and measuring the position of the chuck relative to the stationary base during such movement (column 17, lines 53-67).

CLAIMS 1 and 6-9:

Cameron teaches using a plurality of interferometers, as many as four, to measure the displacement of a stage relative to a plurality of fixed reflectors(Fig. 2). Two interferometers are used to measure displacement along a first axis and any rotation about a second axis which is orthogonal to the first axis(column 5, lines 18-25).

With regard to claims 1 and 6-9, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hill by adding a second interferometer 308 on the opposite side of the chuck 304. This second interferometer would also measure the distance between the base mirror 310 and a second mirror 340 added to the opposite side of the chuck.

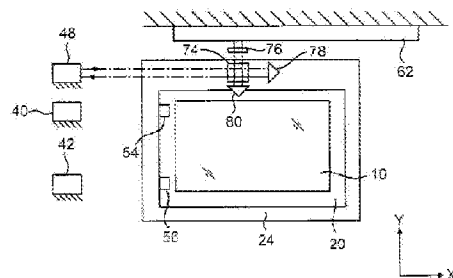
The motivation for this modification is found in Cameron which teaches that using additional interferometers to measure displacement along a specific axis also provide additional measurements of rotation along an orthogonal axis. The additional interferometer provides a redundant output signals which can correct for curvature in the different X, Y or Z mirrors(column 6, lines 27-37).

CLAIM 2:

Hill fails to define an explicit length for the reflector 310 except to state that the distance between the mirror 340 and the mirror 310 is measured as the stages 302 and 304 are moved.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mirror 310 to be longer than the displacement distance of the stage 302. If mirror 310 were shorter than the displacement of stage 302 then the displacement could not be measured over the full displacement of the stages 302 and 304. By making mirror 310 longer than the displacement of stage 302 no information is missed during displacement of the stages 302 and 304.

Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill(6,650,419) and Cameron(5,363,196) as applied to claims 1, 2 and 6-9 above, and further in view of Hamada et al(6,570,641).



As to claim 3/1, Hill **fails to teach** two laser interferometers each having a main part that is attached to said intermediate stage and movable therewith, each main part for measuring the distance between a respective first reflector on the chuck and the same elongated plane mirror reflector on the stationary base.

As to claim 4/1, Hill **fails to teach** three laser interferometers each having a main part. the respective main parts of the three laser interferometers are attached to said intermediate stage and movable therewith, for measuring distances in the

first direction X between one or more first reflectors on the chuck and one or more plane mirror reflectors in the stationary base.

As to claim 5/1, Hill **fails to teach** the chuck further comprising a cube corner reflector.

CLAIMS 3-5:

Hamada et al teach one interferometer mounted on the intermediates stage for measuring the displacement of a corner cube reflector(**Fig. 5B, 80**) mounded on a stage(**Fig. 5B, 20**) relative to a stationary base supporting an elongated reflector(**Fig. 5B, 62**).

With regard to claims 3-5, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hill by moving the off-stage interferometer(**column 17, lines 53-67**) which measures the displacement between the stage 304 and stationary base along the X direction to the intermediate stage, as found in Hamada et al. The motivation for this modification would have been to exclude displacements in the measurement direction caused by the intermediate stage 302. Further, it would have been obvious to increase the number of interferometers mounted on the intermediate stage 304 which measure the displacement in the X direction in order to measure additional degrees of freedom experienced between the stage 304 and the stationary base. The motivation for this modification is found in Cameron which teaches using three interferometers to measure the rotation and pitch(roll) in addition to displacement.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose phone number is 571-272-2432.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached on 571-272-2800 ext. 77.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Samuel A. Turner/
Primary Examiner
Art Unit 2877